

Assisting in the Generation of Useful Climate Scenarios

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SYSTEMS RESEARCH**

THE EARTH INSTITUTE AT COLUMBIA UNIVERSITY

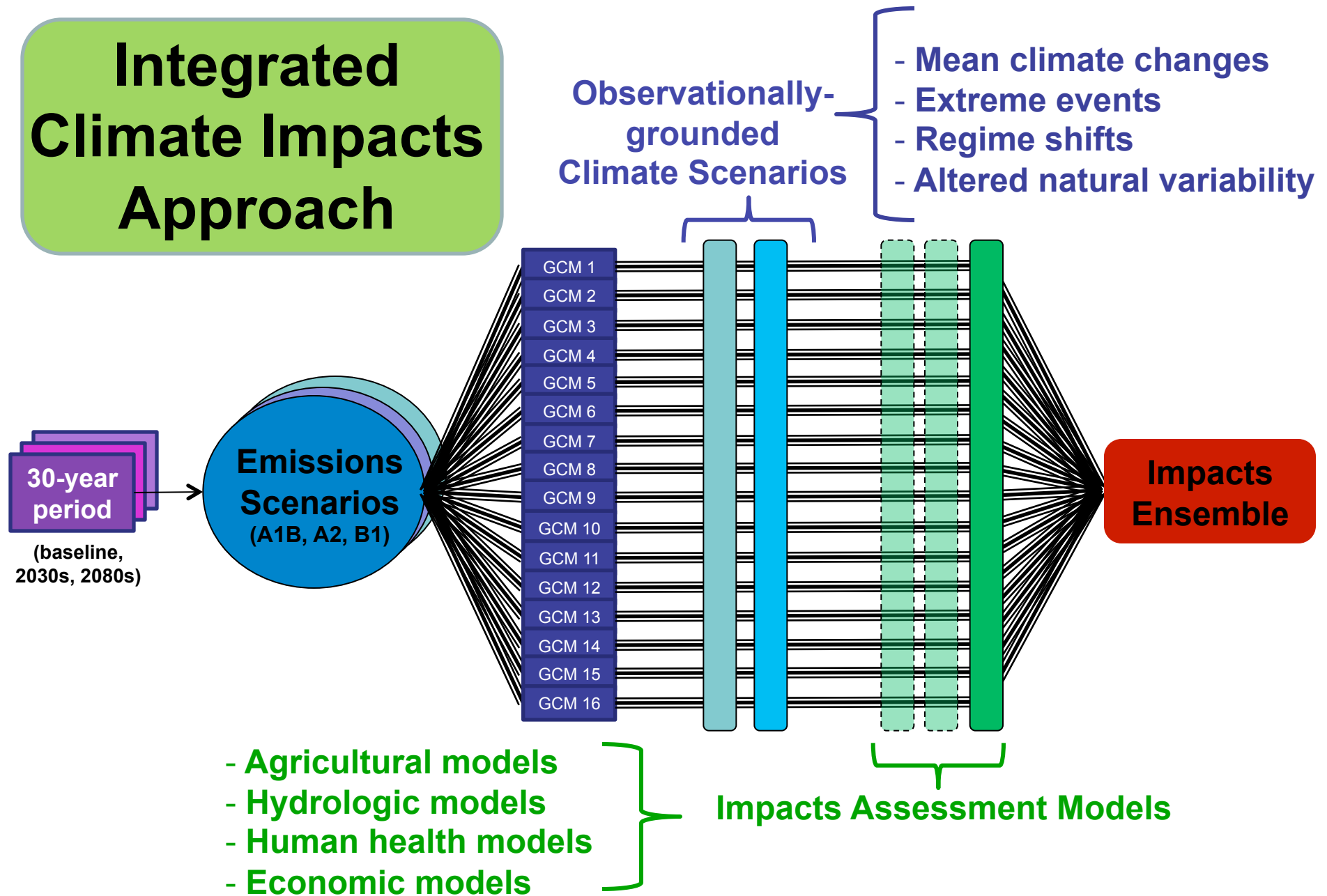
Climate-In-A-Box Workshop - March, 2010

Goals

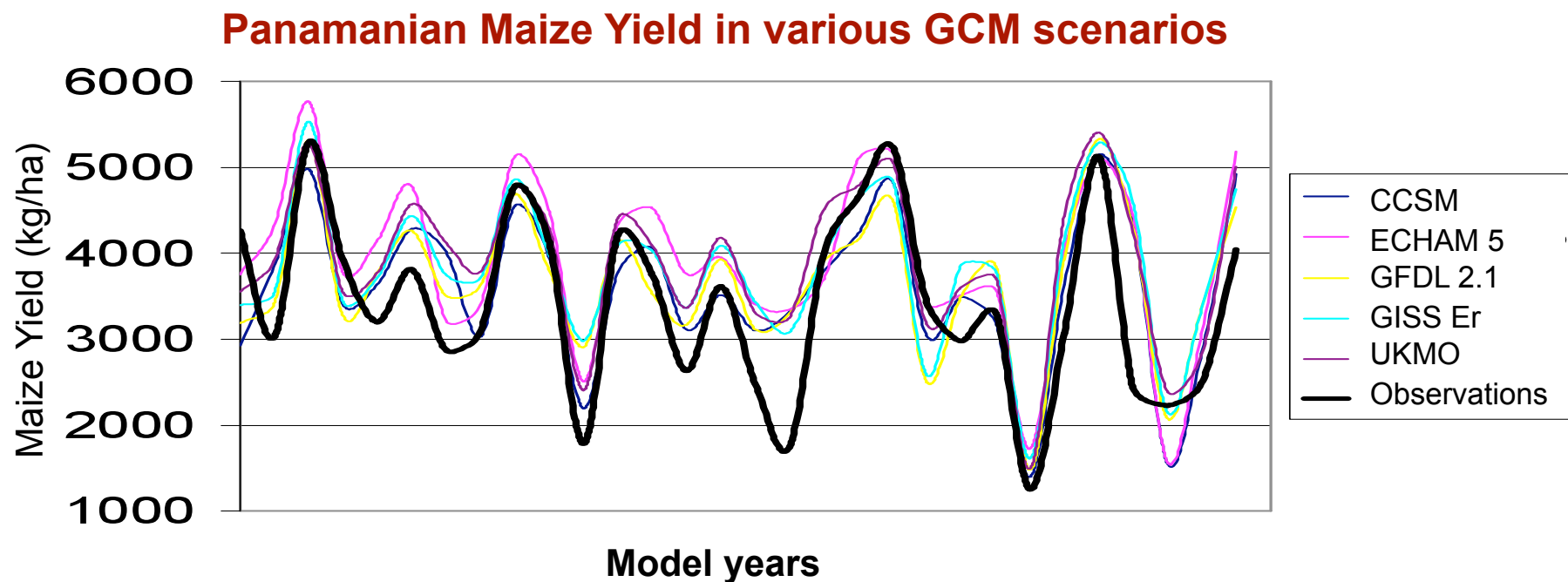
- **Provide easy interface for generating useful climate scenarios from Climate-in-a-Box**
- **Package best climate datasets**
- **Design workflows for coupling observations with regional climate modeling results**
- **Provide tailored climate scenario outputs**

Integrated Climate Impacts Approach

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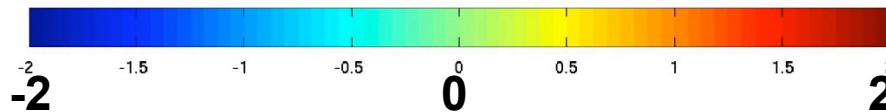
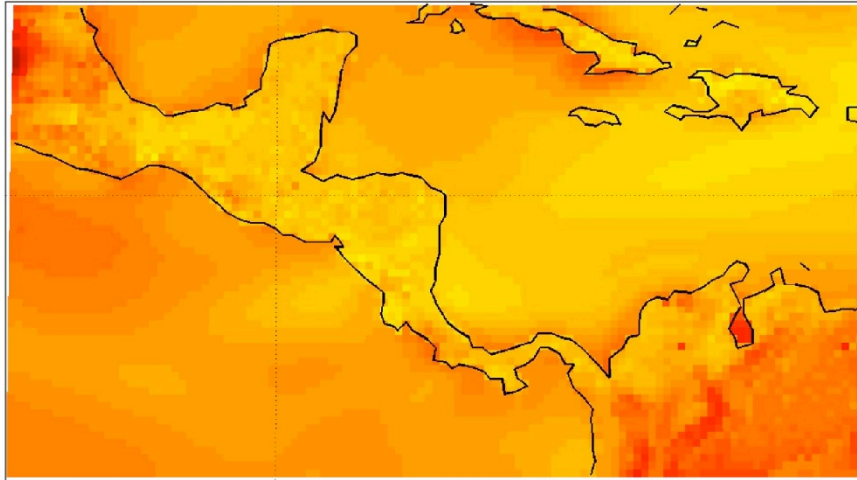
Impacts Assessments Often Have Problem with Signal-to-Noise Ratio



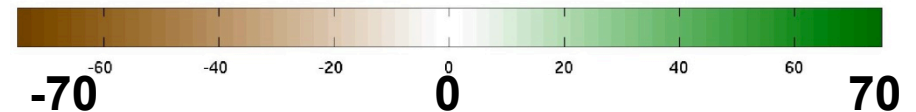
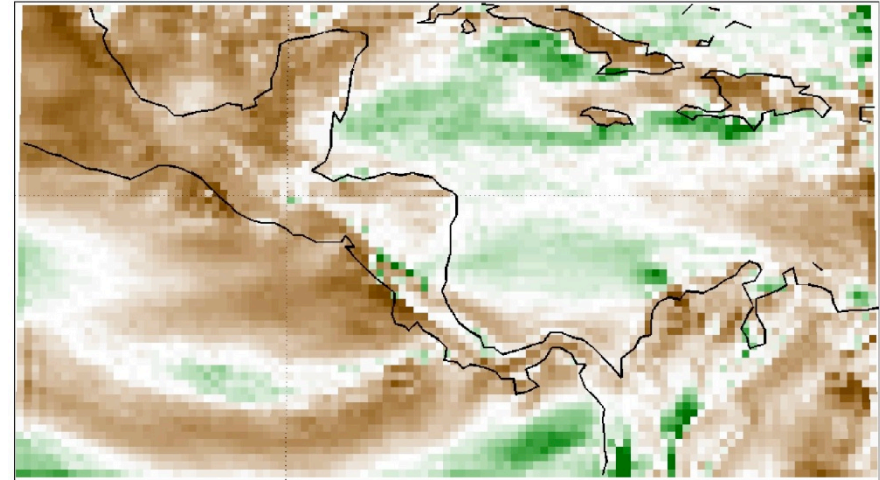
Using Regional Climate Models to Inform Climate Scenarios

Mean shifts (A2 2030s – 1980s)

May-Sep Temperature Change (°C)



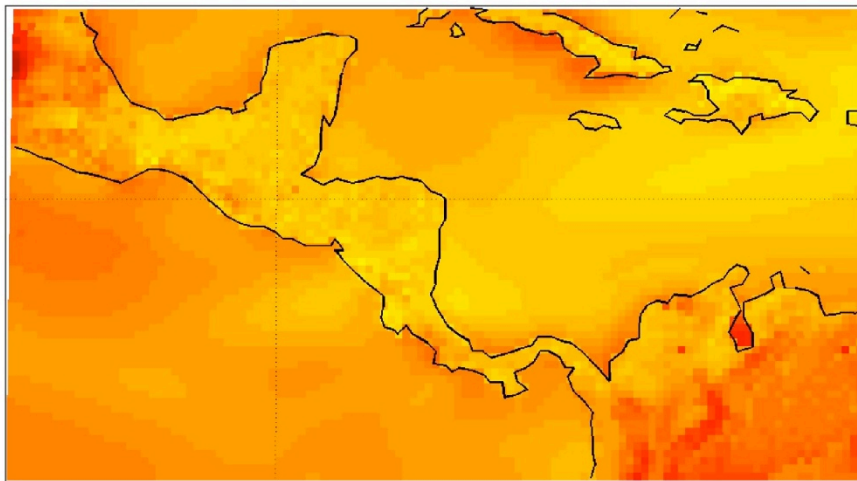
May-Sep Rainfall Change (%)



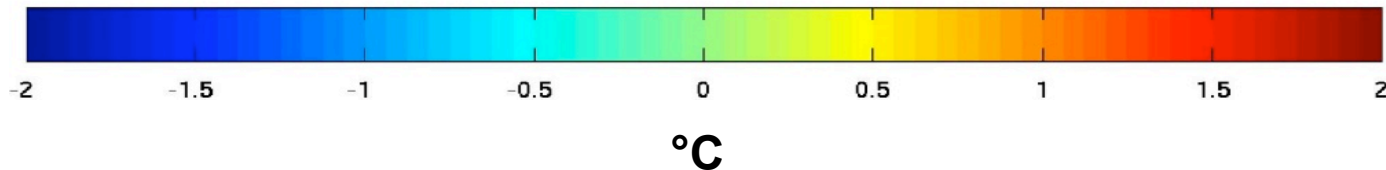
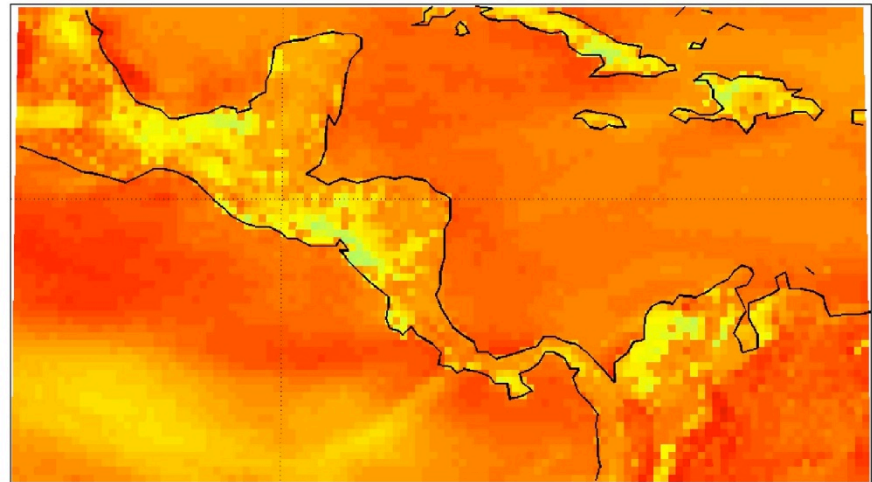
- **Most land areas are warmer and drier during growing season (A2 2030s – 1980s in CCSM/WRF simulation)**

Regional Climate Models add Fine Detail

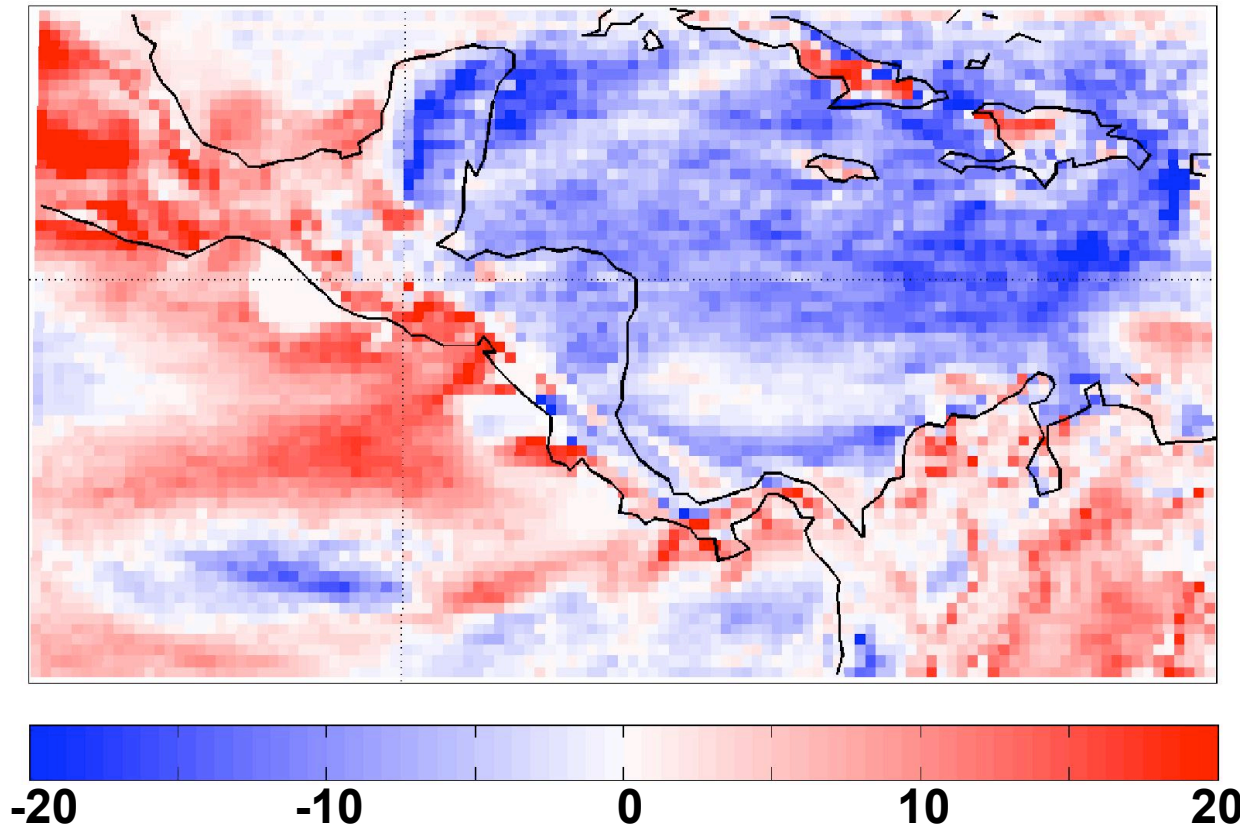
**Change in Mean Temperatures
A2 2030s – 1980s**



**Change in 99th Percentile Temperatures
A2 2030s – 1980s**



Shifts in precipitation extremes

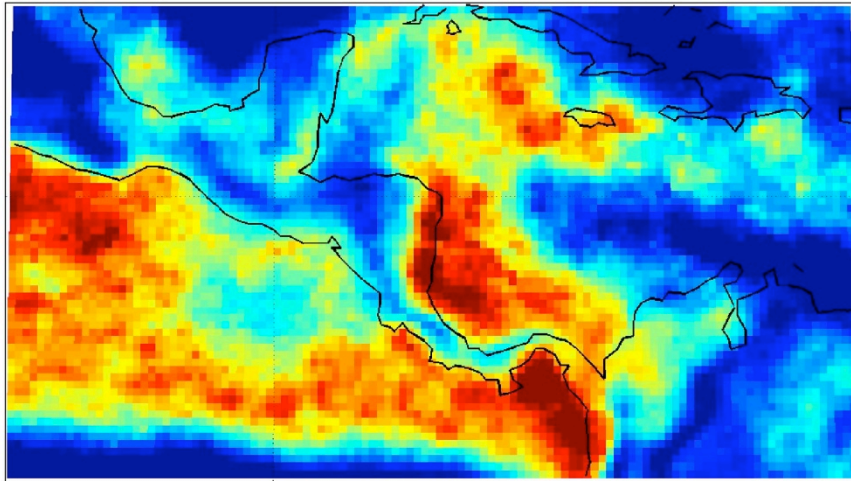


- **Shifts in the percentage of rainfall falling in rainiest 5% of days**
- **Areas with decreasing rainfall and increased extreme characteristics are vulnerable**

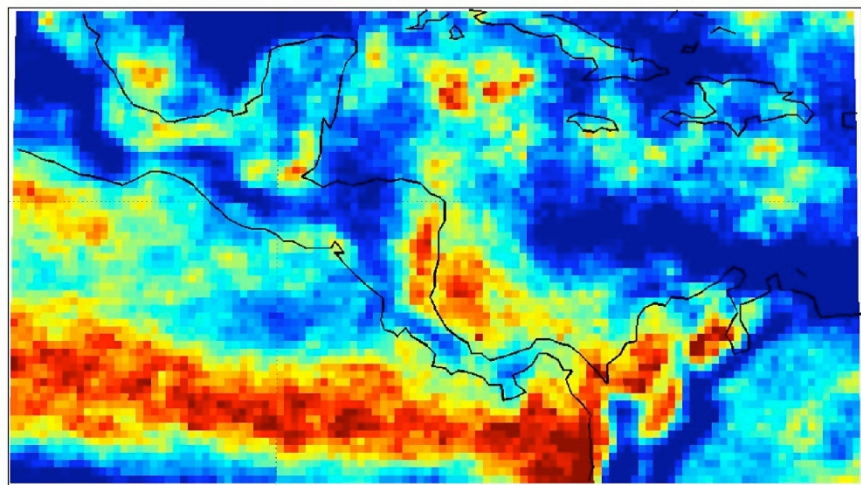
Utilizing State-of-the-Art Climate Datasets

High-resolution Precipitation Products

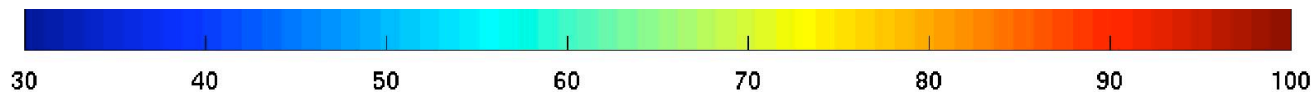
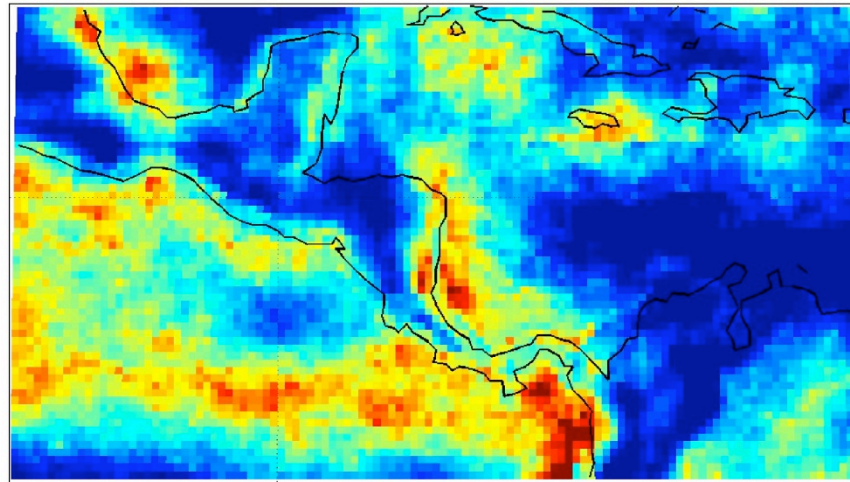
2001-2008 PERSIANN



2003-2008 CMORPH



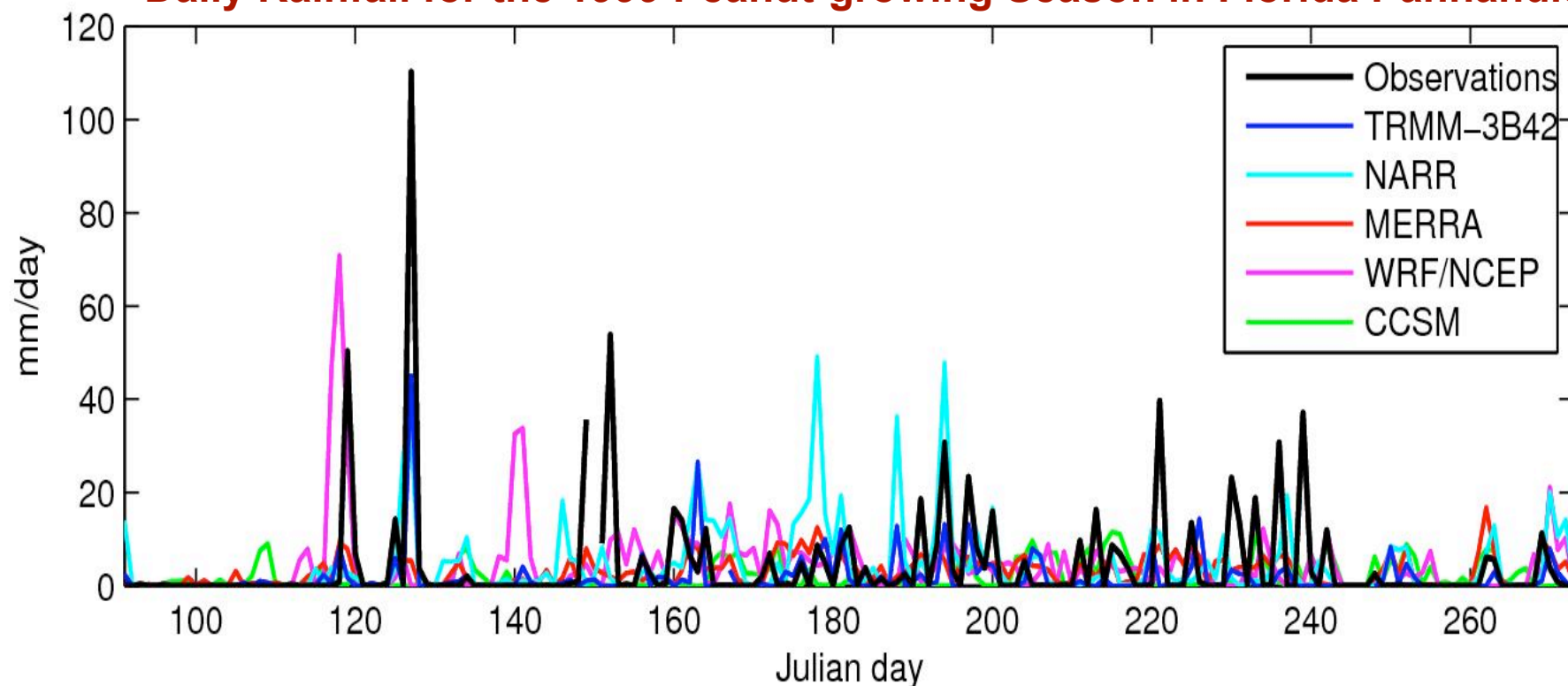
1998-2008 TRMM 3B42



99th percentile day (mm/day)

How important are the differences between climate datasets to impacts assessments?

Daily Rainfall for the 1999 Peanut-growing Season in Florida Panhandle



Tailored Information and Formats

What formats are most useful?

Climate Community: GriB, NetCDF, HDF, ASCII, ...

Impacts Community: Formatted ASCII, Formatted binary, ...

***WEATHER DATA : Chittagong_Bangladesh**

@ INSI LAT LONG ELEV TAV AMP REFHT WNDHT

CHI0 22.350 91.820 33.2 25.9 4.3 -99.0 -99.0

**@DATE SRAD TMAX TMIN RAIN DEWP WIND PAR EVAP
RHUM**

50001 16.6 25.3 12.2 0.0

50002 18.1 24.6 11.5 0.0

50003 18.3 25.0 12.2 0.0

50004 18.3 26.8 11.4 1.9

50005 18.4 27.3 12.8 0.0

50006 18.1 27.7 14.3 0.0

50007 18.1 26.8 14.3 0.0

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50009 18.0 24.7 11.7 0.0

50010 15.6 24.6 12.2 0.0

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